



SEQUENCE LISTING

<110> ~~THAIEN~~ Nohyaku Co., Ltd.

<120> NOVEL PROTOPORPHYRINOGEN OXIDASE TOLERANT TO PHOTOBLEACING HERBICIDE
<130> Q58140
<140> 09/508,418
<141> 2000-03-13
<150> JP 9-265084
<151> 1997-09-11
<160> 11
<170> PatentIn version 3.0
<210> 1
<211> 1874
<212> DNA
<213> Nicotiana tabacum
<220>
<221> exon
<222> (26)..(1672)
<220>
<221> misc_feature
<223> Strain name: Xanthi NC

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cct aat att ttc act cac cag tcg tcg tca tcg cca ttg gca ttc tta 100
Pro Asn Ile Phe Thr His Gln Ser Ser Ser Pro Leu Ala Phe Leu
10 15 20 25

aac cgt acg agt ttc atc cct ttc tct tca atc tcc aag cgc aat agt 148
Asn Arg Thr Ser Phe Ile Pro Phe Ser Ser Ile Ser Lys Arg Asn Ser
30 35 40

gtc aat tgc aat ggc tgg aga aca cga tgc tcc gtt gcc aaa gat tac 196
Val Asn Cys Asn Gly Trp Arg Thr Arg Cys Ser Val Ala Lys Asp Tyr
45 50 55

aca gtt cct tcc tca gcg gtc gac ggc gga ccc gcc gcg gag ctg gac 244
Thr Val Pro Ser Ser Ala Val Asp Gly Gly Pro Ala Ala Glu Leu Asp
60 65 70

gtt ata gtt gga gca gga att agt ggc ctc tgc att gcg cag gtg 292
Asn Val Ile Val Gly Ala Gly Ile Ser Gly Leu Cys Ile Ala Gln Val

75	80	85	
atg tcc gct aat tac ccc aat ttg atg gta acc gag gcg aga gat cgt Met Ser Ala Asn Tyr Pro Asn Leu Met Val Thr Glu Ala Arg Asp Arg	90	95	340
90	95	100	105
gaa ggt ggc aac ata acg act gtg gaa aga gac ggc tat ttg tgg gaa Ala Gly Gly Asn Ile Thr Thr Val Glu Arg Asp Gly Tyr Leu Trp Glu	110	115	388
110	115	120	
gaa ggt ccc aac agt ttc cag ccg tcc gat cct atg ttg act atg gca Glu Gly Pro Asn Ser Phe Gln Pro Ser Asp Pro Met Leu Thr Met Ala	125	130	436
125	130	135	
gta gat tgt gga ttg aag gat gat ttg gtg ttg gga gat cct aat gcg Val Asp Cys Gly Leu Lys Asp Asp Leu Val Leu Gly Asp Pro Asn Ala	140	145	484
140	145	150	
ccc cgt ttc gtt ttg tgg aag ggt aaa tta agg ccc gtc ccc tca aaa Pro Arg Phe Val Leu Trp Lys Gly Lys Leu Arg Pro Val Pro Ser Lys	155	160	532
155	160	165	
ctc act gat ctt ccc ttt ttt gat ttg atg agc att cct ggc aag ttg Leu Thr Asp Leu Pro Phe Asp Leu Met Ser Ile Pro Gly Lys Leu	170	175	580
170	175	180	185
aga gct ggt ttt ggt ccc att ggc ctc cgc cct tca cct cca ggt cat Arg Ala Gly Phe Gly Pro Ile Gly Leu Arg Pro Ser Pro Pro Gly His	190	195	628
190	195	200	
gag gaa tca gtt gag cag ttc gtg cgt cgt aat ctt ggt ggc gaa gtc Glu Glu Ser Val Glu Gln Phe Val Arg Arg Asn Leu Gly Gly Glu Val	205	210	676
205	210	215	
ttt gaa cgc ttg ata gaa cca ttt tgt tct ggt gtt tat gct ggt gat Phe Glu Arg Leu Ile Glu Pro Phe Cys Ser Gly Val Tyr Ala Gly Asp	220	225	724
220	225	230	
ccc tca aaa ctg agt atg aaa gca gca ttt ggg aaa gtt tgg aag ttg Pro Ser Lys Leu Ser Met Lys Ala Ala Phe Gly Lys Val Trp Lys Leu	235	240	772
235	240	245	
gaa gaa act ggt ggt agc att att gga gga acc ttt aaa gca ata aag Glu Glu Thr Gly Gly Ser Ile Ile Gly Gly Thr Phe Lys Ala Ile Lys	250	255	820
250	255	260	265
gag aga tcc agt aca cct aaa gcg ccc cgc gat ccg cgt tta cct aaa Glu Arg Ser Ser Thr Pro Lys Ala Pro Arg Asp Pro Arg Leu Pro Lys	270	275	868
270	275	280	
cca aaa gga cag aca gtt gga tca ttc agg aag ggt ctc aga atg ctg Pro Lys Gly Gln Thr Val Gly Ser Phe Arg Lys Gly Leu Arg Met Leu	285	290	916
285	290	295	
ccg gat gca atc agt gca aga ttg gga agc aaa tta aaa cta tca tgg			964

Pro Asp Ala Ile Ser Ala Arg Leu Gly Ser Lys Leu Lys Leu Ser Trp			
300	305	310	
aag ctt tct agc att act aag tca gaa aaa gga gga tat cac ttg aca			1012
Lys Leu Ser Ser Ile Thr Lys Ser Glu Lys Gly Gly Tyr His Leu Thr			
315	320	325	
tac gag aca cca gaa gga gta gtt tct ctt caa agt cga agc att gtc			1060
Tyr Glu Thr Pro Glu Gly Val Val Ser Leu Gln Ser Arg Ser Ile Val			
330	335	340	345
atg act gtg cca tcc tat gta gca agc aac ata tta cgt cct ctt tcg			1108
Met Thr Val Pro Ser Tyr Val Ala Ser Asn Ile Leu Arg Pro Leu Ser			
350	355	360	
gtt gcc gca gca gat gca ctt tca aat ttc tac tat ccc cca gtt gga			1156
Val Ala Ala Ala Asp Ala Leu Ser Asn Phe Tyr Tyr Pro Pro Val Gly			
365	370	375	
gca gtc aca att tca tat cct caa gaa gct att cgt gat gag cgt ctg			1204
Ala Val Thr Ile Ser Tyr Pro Gln Glu Ala Ile Arg Asp Glu Arg Leu			
380	385	390	
gtt gat ggt gaa cta aag gga ttt ggg cag ttg cat cca cgt aca cag			1252
Val Asp Gly Glu Leu Lys Gly Phe Gly Gln Leu His Pro Arg Thr Gln			
395	400	405	
gga gtg gaa aca cta gga acg ata tat agt tca tca ctc ttc cct aac			1300
Gly Val Glu Thr Leu Gly Thr Ile Tyr Ser Ser Leu Phe Pro Asn			
410	415	420	425
cgt gcc cca aaa ggt cgg gtg cta ctc ttg aac tac att gga gga gca			1348
Arg Ala Pro Lys Gly Arg Val Leu Leu Asn Tyr Ile Gly Gly Ala			
430	435	440	
aaa aat cct gaa att ttg tct aag acg gag agc caa ctt gtg gaa gta			1396
Lys Asn Pro Glu Ile Leu Ser Lys Thr Glu Ser Gln Leu Val Glu Val			
445	450	455	
gtt gat cgt gac ctc aga aaa atg ctt ata aaa ccc aaa gct caa gat			1444
Val Asp Arg Asp Leu Arg Lys Met Leu Ile Lys Pro Lys Ala Gln Asp			
460	465	470	
cct ctt gtt gtg ggt gtg cga gta tgg cca caa gct atc cca cag ttt			1492
Pro Leu Val Val Gly Val Arg Val Trp Pro Gln Ala Ile Pro Gln Phe			
475	480	485	
ttg gtt ggt cat ctg gat acg cta agt act gca aaa gct gct atg aat			1540
Leu Val Gly His Leu Asp Thr Leu Ser Thr Ala Lys Ala Ala Met Asn			
490	495	500	505
gat aat ggg ctt gaa ggg ctg ttt ctt ggg ggt aat tat gtg tca ggt			1588
Asp Asn Gly Leu Glu Gly Leu Phe Leu Gly Gly Asn Tyr Val Ser Gly			
510	515	520	

gta gca ttg ggg agg tgt gtt gaa ggt gct tat gaa gtt gca tcc gag 1636
Val Ala Leu Gly Arg Cys Val Glu Gly Ala Tyr Glu Val Ala Ser Glu
525 530 535

gta aca gga ttt ctg tct cgg tat gca tac aaa tga aacctgtgtt 1682
Val Thr Gly Phe Leu Ser Arg Tyr Ala Tyr Lys
540 545

gggggtagtc caaacccgt tagtagtacg atcatgcctt gggaaaattg gcatgtgcct 1742
aaaagtttg ctcatttagag ttattttagc cttggtaaat gatttgtact tgatatcagt 1802
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aaaaaaaaaa aa 1874

<210> 2
<211> 548
<212> PRT
<213> Nicotiana tabacum

<220>
<221> misc_feature
<223> Strain name: SR1

<400> 2

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Phe Ser Ser Ile Ser Lys Arg Asn Ser Val Asn Cys Asn Gly Trp Arg
35 40 45

Thr Arg Cys Ser Val Ala Lys Asp Tyr Thr Val Pro Ser Ser Ala Val
50 55 60

Asp Gly Gly Pro Ala Ala Glu Leu Asp Cys Val Ile Val Gly Ala Gly
65 70 75 80

Ile Ser Gly Leu Cys Ile Ala Gln Val Met Ser Ala Asn Tyr Pro Asn
85 90 95

Leu Met Val Thr Glu Ala Arg Asp Arg Ala Gly Gly Asn Ile Thr Thr
100 105 110

Val Glu Arg Asp Gly Tyr Leu Trp Glu Glu Gly Pro Asn Ser Phe Gln
115 120 125

Pro Ser Asp Pro Met Leu Thr Met Ala Val Asp Cys Gly Leu Lys Asp
130 135 140

Asp Leu Val Leu Gly Asp Pro Asn Ala Pro Arg Phe Val Leu Trp Lys
145 150 155 160

Gly Lys Leu Arg Pro Val Pro Ser Lys Leu Thr Asp Leu Pro Phe Phe
165 170 175

Asp Leu Met Ser Ile Pro Gly Lys Leu Arg Ala Gly Phe Gly Pro Ile
180 185 190

Gly Leu Arg Pro Ser Pro Pro Gly His Glu Glu Ser Val Glu Gln Phe
195 200 205

Val Arg Arg Asn Leu Gly Gly Glu Val Phe Glu Arg Leu Ile Glu Pro
210 215 220

Phe Cys Ser Gly Val Tyr Val Gly Asp Pro Ser Lys Leu Ser Met Lys
225 230 235 240

Ala Ala Phe Gly Lys Val Trp Lys Leu Glu Glu Thr Gly Gly Ser Ile
245 250 255

Ile Gly Gly Thr Phe Lys Ala Ile Lys Glu Arg Ser Ser Thr Pro Lys
260 265 270

Ala Pro Arg Asp Pro Arg Leu Pro Lys Pro Lys Gly Gln Thr Val Gly
275 280 285

Ser Phe Arg Lys Gly Leu Arg Met Leu Pro Asp Ala Ile Ser Ala Arg
290 295 300

Leu Gly Ser Lys Leu Lys Leu Ser Trp Lys Leu Ser Ser Ile Thr Lys
305 310 315 320

Ser Glu Lys Gly Gly Tyr His Leu Thr Tyr Glu Thr Pro Glu Gly Val
325 330 335

Val Ser Leu Gln Ser Arg Ser Ile Val Met Thr Val Pro Ser Tyr Val
340 345 350

Ala Ser Asn Ile Leu Arg Pro Leu Ser Val Ala Ala Asp Ala Leu
355 360 365

Ser Asn Phe Tyr Tyr Pro Pro Val Gly Ala Val Thr Ile Ser Tyr Pro
370 375 380

Gln Glu Ala Ile Arg Asp Glu Arg Leu Val Asp Gly Glu Leu Lys Gly
385 390 395 400

Phe Gly Gln Leu His Pro Arg Thr Gln Gly Val Glu Thr Leu Gly Thr
405 410 415

Ile Tyr Ser Ser Ser Leu Phe Pro Asn Arg Ala Pro Lys Gly Arg Val
420 425 430

Leu Leu Leu Asn Tyr Ile Gly Gly Ala Lys Asn Pro Glu Ile Leu Ser
435 440 445

Lys Thr Glu Ser Gln Leu Val Glu Val Val Asp Arg Asp Leu Arg Lys
450 455 460

Met Leu Ile Lys Pro Lys Ala Gln Asp Pro Leu Val Val Gly Val Arg
465 470 475 480

Val Trp Pro Gln Ala Ile Pro Gln Phe Leu Val Gly His Leu Asp Thr
485 490 495

Leu Ser Thr Ala Lys Ala Ala Met Asn Asp Asn Gly Leu Glu Gly Leu
500 505 510

Phe Leu Gly Gly Asn Tyr Val Ser Gly Val Ala Leu Gly Arg Cys Val
515 520 525

Glu Gly Ala Tyr Glu Val Ala Ser Glu Val Thr Gly Phe Leu Ser Arg
530 535 540

Tyr Ala Tyr Lys
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<210> 3
<211> 1874
<212> DNA
<213> Nicotiana tabacum

<220>
<221> exon
<222> (26)..(1672)

<220>
<221> misc_feature
<223> Strain name: SR1

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Met Thr Thr Pro Ile Ala Asn His
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Pro Asn Ile Phe Thr His Gln Ser Ser Ser Pro Leu Ala Phe Leu
10 15 20 25

aac cgt acg agt ttc atc cct ttc tct tca atc tcc aag cgc aat agt 148
Asn Arg Thr Ser Phe Ile Pro Phe Ser Ser Ile Ser Lys Arg Asn Ser
30 35 40

gtc aat tgc aat ggc tgg aga aca cga tgc tcc gtt gcc aaa gat tac 196
Val Asn Cys Asn Gly Trp Arg Thr Arg Cys Ser Val Ala Lys Asp Tyr
45 50 55

aca gtt cct tcc tca gcg gtc gac ggc gga ccc gcc gcg gag ctg gac	244
Thr Val Pro Ser Ser Ala Val Asp Gly Gly Pro Ala Ala Glu Leu Asp	
60 65 70	
tgt gtt ata gtt gga gca gga att agt ggc ctc tgc att gcg cag gtg	292
Cys Val Ile Val Gly Ala Gly Ile Ser Gly Leu Cys Ile Ala Gln Val	
75 80 85	
atg tcc gct aat tac ccc aat ttg atg gta acc gag gcg aga gat cgt	340
Met Ser Ala Asn Tyr Pro Asn Leu Met Val Thr Glu Ala Arg Asp Arg	
90 95 100 105	
gcc ggt ggc aac ata acg act gtg gaa aga gac ggc tat ttg tgg gaa	388
Ala Gly Gly Asn Ile Thr Thr Val Glu Arg Asp Gly Tyr Leu Trp Glu	
110 115 120	
gaa ggt ccc aac agt ttc cag ccg tcc gat cct atg ttg act atg gca	436
Glu Gly Pro Asn Ser Phe Gln Pro Ser Asp Pro Met Leu Thr Met Ala	
125 130 135	
gta gat tgt gga ttg aag gat gat ttg gtg ttg gga gat cct aat gcg	484
Val Asp Cys Gly Leu Lys Asp Asp Leu Val Leu Gly Asp Pro Asn Ala	
140 145 150	
ccc cgt ttc gtt ttg tgg aag ggt aaa tta agg ccc gtc ccc tca aaa	532
Pro Arg Phe Val Leu Trp Lys Gly Lys Leu Arg Pro Val Pro Ser Lys	
155 160 165	
ctc act gat ctt ccc ttt ttt gat ttg atg agc att cct ggc aag ttg	580
Leu Thr Asp Leu Pro Phe Asp Leu Met Ser Ile Pro Gly Lys Leu	
170 175 180 185	
aga gct ggt ttt ggt gcc att ggc ctc cgc cct tca cct cca ggt cat	628
Arg Ala Gly Phe Gly Ala Ile Gly Leu Arg Pro Ser Pro Pro Gly His	
190 195 200	
gag gaa tca gtt gag cag ttc gtg cgt cgt aat ctt ggt ggc gaa gtc	676
Glu Glu Ser Val Glu Gln Phe Val Arg Arg Asn Leu Gly Gly Glu Val	
205 210 215	
ttt gaa cgc ttg ata gaa cca ttt tgt tct ggt gtt tat gtt ggt gat	724
Phe Glu Arg Leu Ile Glu Pro Phe Cys Ser Gly Val Tyr Val Gly Asp	
220 225 230	
ccc tca aaa ctg agt atg aaa gca gca ttt ggg aaa gtt tgg aag ttg	772
Pro Ser Lys Leu Ser Met Lys Ala Ala Phe Gly Lys Val Trp Lys Leu	
235 240 245	
gaa gaa act ggt ggt agc att att gga gga acc ttt aaa gca ata aag	820
Glu Glu Thr Gly Gly Ser Ile Ile Gly Gly Thr Phe Lys Ala Ile Lys	
250 255 260 265	
gag aga tcc agt aca cct aaa gcg ccc cgc gat ccg cgt tta cct aaa	868
Glu Arg Ser Ser Thr Pro Lys Ala Pro Arg Asp Pro Arg Leu Pro Lys	
270 275 280	

cca aaa gga cag aca gtt gga tca ttc agg aag ggt ctc aga atg ctg Pro Lys Gly Gln Thr Val Gly Ser Phe Arg Lys Gly Leu Arg Met Leu 285 290 295	916
ccg gat gca atc agt gca aga ttg gga agc aaa tta aaa cta tca tgg Pro Asp Ala Ile Ser Ala Arg Leu Gly Ser Lys Leu Lys Leu Ser Trp 300 305 310	964
aag ctt tct agc att act aag tca gaa aaa gga gga tat cac ttg aca Lys Leu Ser Ser Ile Thr Lys Ser Glu Lys Gly Tyr His Leu Thr 315 320 325	1012
tac gag aca cca gaa gga gta gtt tct ctt caa agt cga agc att gtc Tyr Glu Thr Pro Glu Gly Val Val Ser Leu Gln Ser Arg Ser Ile Val 330 335 340 345	1060
atg act gtg cca tcc tat gta gca agc aac ata tta cgt cct ctt tcg Met Thr Val Pro Ser Tyr Val Ala Ser Asn Ile Leu Arg Pro Leu Ser 350 355 360	1108
gtt gcc gca gca gat gca ctt tca aat ttc tac tat ccc cca gtt gga Val Ala Ala Ala Asp Ala Leu Ser Asn Phe Tyr Tyr Pro Pro Val Gly 365 370 375	1156
gca gtc aca att tca tat cct caa gaa gct att cgt gat gag cgt ctg Ala Val Thr Ile Ser Tyr Pro Gln Glu Ala Ile Arg Asp Glu Arg Leu 380 385 390	1204
gtt gat ggt gaa cta aag gga ttt ggg cag ttg cat cca cgt aca cag Val Asp Gly Glu Leu Lys Gly Phe Gly Gln Leu His Pro Arg Thr Gln 395 400 405	1252
gga gtg gaa aca cta gga acg ata tat agt tca tca ctc ttc cct aac Gly Val Glu Thr Leu Gly Thr Ile Tyr Ser Ser Leu Phe Pro Asn 410 415 420 425	1300
cgt gcc cca aaa ggt cgg gtg cta ctc ttg aac tac att gga gga gca Arg Ala Pro Lys Gly Arg Val Leu Leu Asn Tyr Ile Gly Gly Ala 430 435 440	1348
aaa aat cct gaa att ttg tct aag acg gag agc caa ctt gtg gaa gta Lys Asn Pro Glu Ile Leu Ser Lys Thr Glu Ser Gln Leu Val Glu Val 445 450 455	1396
gtt gat cgt gac ctc aga aaa atg ctt ata aaa ccc aaa gct caa gat Val Asp Arg Asp Leu Arg Lys Met Leu Ile Lys Pro Lys Ala Gln Asp 460 465 470	1444
cct ctt gtt gtg ggt gtg cga gta tgg cca caa gct atc cca cag ttt Pro Leu Val Val Gly Val Arg Val Trp Pro Gln Ala Ile Pro Gln Phe 475 480 485	1492
ttg gtt ggt cat ctg gat acg cta agt act gca aaa gct gct atg aat Leu Val Gly His Leu Asp Thr Leu Ser Thr Ala Lys Ala Ala Met Asn	1540

490	495	500	505	
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515				520
gta gca ttg ggg agg tgt gtt gaa ggt gct tat gaa gtt gca tcc gag Val Ala Leu Gly Arg Cys Val Glu Gly Ala Tyr Glu Val Ala Ser Glu 525				1636
530				535
gta aca gga ttt ctg tct cgg tat gca tac aaa tga aacctgtgtt Val Thr Gly Phe Leu Ser Arg Tyr Ala Tyr Lys 540				1682
545				
ggggtagtc caaaccttgt tagtagtacg atcatgcctt gggaaaattg gcatgtgcct				1742
aaaagtttg ctcatttagag ttattttagc cttggtaat gatttgtact tgatatcagt				1802
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aaaaaaaaaa aa				1874
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<210> 7
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<220>
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<220>
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<210> 9
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<212> DNA
<213> artificial sequence

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27

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<213> Arabidopsis thaliana

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Arg Cys Ser Val Ala Gly Gly Pro Thr Val Gly Ser Ser Lys Ile Glu
35 40 45

Gly Gly Gly Thr Thr Ile Thr Thr Asp Cys Val Ile Val Gly Gly
50 55 60

Gly Ile Ser Gly Leu Cys Ile Ala Gln Ala Leu Ala Thr Lys His Pro
65 70 75 80

Asp Ala Ala Pro Asn Leu Ile Val Thr Glu Ala Lys Asp Arg Val Gly
85 90 95

Gly Asn Ile Ile Thr Arg Glu Glu Asn Gly Phe Leu Trp Glu Glu Gly
100 105 110

Pro Asn Ser Phe Gln Pro Ser Asp Pro Met Leu Thr Met Val Val Asp
115 120 125

Ser Gly Leu Lys Asp Asp Leu Val Leu Gly Asp Pro Thr Ala Pro Arg
130 135 140

Phe Val Leu Trp Asn Gly Lys Leu Arg Pro Val Pro Ser Lys Leu Thr
145 150 155 160

Asp Leu Pro Phe Phe Asp Leu Met Ser Ile Gly Gly Lys Ile Arg Ala
165 170 175

Gly Phe Gly Ala Leu Gly Ile Arg Pro Ser Pro Pro Gly Arg Glu Glu
180 185 190

Ser Val Glu Glu Phe Val Arg Arg Asn Leu Gly Asp Glu Val Phe Glu
195 200 205

Arg Leu Ile Glu Pro Phe Cys Ser Gly Val Tyr Ala Gly Asp Pro Ser
210 215 220

Lys Leu Ser Met Lys Ala Ala Phe Gly Lys Val Trp Lys Leu Glu Gln
225 230 235 240

Asn Gly Gly Ser Ile Ile Gly Gly Thr Phe Lys Ala Ile Gln Glu Arg
245 250 255

Lys Asn Ala Pro Lys Ala Glu Arg Asp Pro Arg Leu Pro Lys Pro Gln
260 265 270

Gly Gln Thr Val Gly Ser Phe Arg Lys Gly Leu Arg Met Leu Pro Glu
275 280 285

Ala Ile Ser Ala Arg Leu Gly Ser Lys Val Lys Leu Ser Trp Lys Leu
290 295 300

Ser Gly Ile Thr Lys Leu Glu Ser Gly Gly Tyr Asn Leu Thr Tyr Glu
305 310 315 320

Thr Pro Asp Gly Leu Val Ser Val Gln Ser Lys Ser Val Val Met Thr
325 330 335

Val Pro Ser His Val Ala Ser Gly Leu Leu Arg Pro Leu Ser Glu Ser
340 345 350

Ala Ala Asn Ala Leu Ser Lys Leu Tyr Tyr Pro Pro Val Ala Ala Val
355 360 365

Ser Ile Ser Tyr Pro Lys Glu Ala Ile Arg Thr Glu Cys Leu Ile Asp
370 375 380

Gly Glu Leu Lys Gly Phe Gly Gln Leu His Pro Arg Thr Gln Gly Val
385 390 395 400

Glu Thr Leu Gly Thr Ile Tyr Ser Ser Ser Leu Phe Pro Asn Arg Ala
405 410 415

Pro Pro Gly Arg Ile Leu Leu Leu Asn Tyr Ile Gly Gly Ser Thr Asn
420 425 430

Thr Gly Ile Leu Ser Lys Ser Glu Gly Glu Leu Val Glu Ala Val Asp
435 440 445

Arg Asp Leu Arg Lys Met Leu Ile Lys Pro Asn Ser Thr Asp Pro Leu
450 455 460

Lys Leu Gly Val Arg Val Trp Pro Gln Ala Ile Pro Gln Phe Leu Val
465 470 475 480

Gly His Phe Asp Ile Leu Asp Thr Ala Lys Ser Ser Leu Thr Ser Ser
485 490 495

Gly Tyr Glu Gly Leu Phe Leu Gly Gly Asn Tyr Val Ala Gly Val Ala
500 505 510

Leu Gly Arg Cys Val Glu Gly Ala Tyr Glu Thr Ala Ile Glu Val Asn
515 520 525

Asn Phe Met Ser Arg Tyr Ala Tyr Lys
530 535